AMENDMENTS TO THE CLAIMS

Please amend the claims as follows.

1. (Currently amended) A method of operating a directory server system, comprising a directory server interacting with entries organized in a tree structure, in which said entries comprise user entries and role entries, ones of said role entries defining a role, and having an associated scope in the tree, the scope being defined from the location of said ones of said role entries in the tree, according to a predefined rule, with the role of an existing role entry being attached to a user entry subject to a first condition, which comprises a role membership condition and the fact that the user entry belongs to the scope of the existing role entry, the method comprising:

   a) associating an existing role entry in a tree structure with a first user entry in the tree structure, wherein a directory server interacts with entries in the tree structure, and wherein the existing role entry defines a role and has an associated scope in the tree structure based on the existing role entry's location in the tree structure according to a predefined rule, said associating comprising attaching the role to the first user entry subject to a first condition comprising a role membership condition and the first user entry belonging to the associated scope;

   b) adding extra role data to the existing role entry identifying an extra scope in the tree for the existing role entry adding an attribute to the existing role entry having a special attribute name and being associated with an attribute value defining an extra scope in the tree structure for the existing role entry, wherein the attribute value identifies a designated location in the tree structure outside the existing role entry's associated scope, and further wherein the extra scope is based on the designated location according to a second predefined rule; and

   [[b)]]c)   attaching the role of the existing role entry to a second user entry subject to a second condition comprising said role membership condition and the second user entry belonging to the extra scope.

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2. (Currently Amended) The method of claim 1, wherein the existing role entry ~~is an indirect role entry designating one or more other roles~~ is a nested role entry defining at least one other role.

3. (Currently Amended) The method of claim 2, wherein the existing [[indirect]] role entry has an attribute ~~designating the~~ said ~~one or more other roles~~ defining the at least one other role.

4. (Currently Amended) The method of claim 1, wherein the role membership condition comprises [[the]] a candidate user entry having an attribute designating the role [[in]] defined by the existing role entry.

5. (Currently Amended) The method of claim 1, wherein the existing role entry has a role filter condition, and the role membership condition comprises one or more attributes of [[the]] a candidate user entry meeting the role filter condition.

6. (Original) The method of claim 5, wherein the existing role entry has an attribute designating the role filter condition.

7. (Cancelled)

8. (Cancelled)

9. (Currently Amended) The method of claim [[8]] 1, wherein the extra scope is defined as a subtree of the designated location.

10. (Currently Amended) The method of claim 1, wherein the predefined rule comprises defining the existing role entry's associated scope [[of the existing role entry]] as a subtree of a parent of the existing role entry in the tree structure.

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11. (Currently Amended) The method of claim 1, further comprising:

[[(c)]]d) responding to a request of whether a designated user entry has a given role by:

[[(c1)]]d1) [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

[[(c2)]]d2) determining whether the designated user entry meets the first condition in relation to the corresponding role entry;[[,]]

[[(c3)]]d3) if the designated user entry does not meet the first condition in relation to the corresponding role entry, determining whether the corresponding role entry has extra role data identifying an extra scope[[,]]; and[[,]]

[[(c4)]]d4) if the designated user entry does meet the first condition if the corresponding role entry has extra role data, determining whether the designated user entry meets the second condition in relation to the corresponding role entry.

12. (Currently Amended) The method of claim 1, further comprising:

[[(c)]]d) responding to a request for any user entries having a given role by:

[[(c1)]]d1) [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

[[(c2)]]d2) scanning the tree to [[determine]] identify any user entries meeting the first condition in relation to the corresponding role entry;[[,]] and

[[(c3)]]d3) [[determining whether]] if the corresponding role entry [[corresponding to the given role]] has extra role data identifying an extra scope, [[and, if so,]] scanning the tree to [[determine]] identify any user entries meeting the second condition in relation to the corresponding role entry.

13. (Currently Amended) The method of claim 1, further comprising:

[[c)]]d) responding to a request for roles of a given user entry by:

[[c1)]]d1) [[determining]] identifying a candidate role entry[[,]];

[[c2)]]d2) determining whether the given user entry meets the first condition [[for the determined]] in relation to the candidate role entry[[,]];

[[c3)]]d3) if the given user entry does not meet the first condition in relation to the candidate role entry[[, determining whether]] and the [[determined]] candidate role entry has extra role data identifying an extra scope, [[and, if so,]] determining whether the given user entry meets the second condition [[for the determined]] in relation to the candidate role entry[[,]]; and

[[c4)]]d4) repeating said [[c1)]] d1) through said [[c3)]] d3) with other candidate role entries until an end condition is met.

14. (Currently Amended) The method of claim 13, wherein the end condition comprises having [[scanned]] performed said d1) through said d3) with substantially all the applicable [[roles]] candidate role entries.

15. (Currently Amended) The method of claim 13, [[in which]] wherein the given user entry belongs to a subtree of a top suffix of the tree structure, [[wherein:]] said [[c2)]] d2) is performed for each role entry belonging to the subtree of said top suffix, and said [[c3)]] d3) is performed for each role entry belonging to any subtree of any top suffix of the tree structure, for each role belonging to the subtree of said top suffix.

16. (Currently Amended) A directory server system[[,]] comprising:

~~a directory server interacting with entries organized in a tree structure, said entries comprising user entries and role entries, ones of said role entries defining a role and having an associated scope in the tree structure, the scope being defined from the location of said ones of said roles entries in the tree structure, according to a predefined rule,~~

a directory server interacting with entries in a tree structure, said tree structure comprising an existing role entry and a first user entry, wherein the existing role entry defines a role and has an associated scope in the tree structure based on the existing role entry's location in the tree structure according to a predefined rule;

a role mechanism capable of attaching [[a]] the existing role entry's role [[of an existing role entry]] to [[a]] the first user entry subject to a first condition[[, said first condition]] comprising a role membership condition and the first user entry belonging to the associated scope[[of the existing role entry,]]; and

said role mechanism [[being]] further capable of ~~determining whether said existing role entry has extra data designating an extra scope, and, if so, of~~ attaching [[a]] the existing rule entry's role [[of the existing rule entry]] to a second user entry subject to a second condition[[, which comprises]] comprising said role membership condition and the second user entry belonging to [[the]] an extra scope identified by extra role data of the existing role entry, wherein the extra role data comprise an added attribute having a special attribute name and being associated with an attribute value identifying a designated location in the tree structure outside of the existing role entry's associated scope, and the extra scope is based on the designated location according to a second predefined rule.

17. (Currently Amended) The directory server system of claim 16, [[in which]] wherein the existing role entry ~~is an indirect role entry, designating one or more other roles~~ is a nested role entry defining at least one other role.

18. (Currently Amended) The directory server system of claim 17, [[in which]] wherein the existing [[indirect]] role entry has an attribute ~~designating the said one or more other roles~~ defining the at least one other role.

19. (Currently Amended) The directory server system of claim 16, wherein the role membership condition comprises [[the]] a candidate user entry having an attribute designating the role [[in the]] defined by the existing role entry.

20. (Currently Amended) The directory server system of claim 16, wherein the existing role entry has a role filter condition, and the role membership condition comprises one or more attributes of [[the]] a candidate user entry meeting the role filter condition.

21. (Original) The directory server system of claim 20, wherein the existing role entry has an attribute designating the role filter condition.

22. (Cancelled)

23. (Cancelled)

24. (Currently Amended) The directory server system of claim [[23]] 16, wherein the extra scope is defined as a subtree of the designated location.

25. (Currently Amended) The directory server system of claim 16, wherein the predefined rule comprises defining the existing role entry's associated scope [[of a role entry]] as a subtree of a parent of [[that]] the existing role entry in the tree structure.

26. (Currently Amended) The directory server system of claim 16, wherein the role mechanism [[has a first function for]] is further capable of responding to a request of whether a designated user entry has a given role, said first function being capable of by:

    i)   [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

    ii)   determining whether the designated user entry meets the first condition in relation to the corresponding role entry[[,]];

    iii)   if the designated user entry does not meet the first condition in relation to the corresponding role entry, determining whether the corresponding role entry has extra role data defining an extra scope[[,]]; and[[,]]

    iv)   if the designated user entry does meet the first condition if the corresponding role entry has extra role data, determining whether the designated user entry meets the second condition in relation to the corresponding role entry.

27. (Currently Amended) The directory server system of claim 16, wherein the role mechanism [[has a second function for]] is further capable of responding to a request for any user entries having a given role, said second function being capable of by:

    i)   [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

    ii)   scanning the tree to [[determine]] identify any user entries meeting the first condition in relation to the corresponding role entry;[[,]] and

    iii)   [[determining whether]] if the corresponding role entry [[corresponding to the given role]] has extra data identifying an extra scope, [[and, if so,]] scanning the tree to [[determine]] identify any user entries meeting the second condition in relation to the corresponding role entry.

28. (Currently Amended) The directory server system [[as claimed]] of claim 16, wherein the role mechanism [[has a third function for]] is further capable of responding to a request for [[the]] roles of a given user entry, said third function being capable of by:

    i)   [[determining]] identifying a candidate role entry[[,]];

    ii)   determining whether the given user entry meets the first condition [[for the determined]] in relation to the candidate role entry[[,]];

    iii)   if the given user entry does not meet the first condition in relation to the candidate role entry[[, determining whether]] and the determined role entry has extra data identifying an extra scope, [[and, if so,]] determining whether the given user entry meets the second condition [[for the determined]] in relation to the candidate role entry[[,]]; and

    iv)   repeating said i) through said iii) with other candidate roles entries until an end condition is met.

29. (Currently Amended) The directory server system of claim 28, wherein the end condition comprises having [[scanned]] performed said i) through said iii) with substantially all the applicable [[roles]] candidate role entries.

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30. (Currently Amended) The directory server system of claim 28, wherein [[in which]] the given user entry belongs to a subtree of a top suffix of the tree structure, [[wherein:]] said ii) is performed for each role entry belonging to the subtree of said top suffix, and said [[ii)]] iii) is performed for each role entry belonging to any subtree of any top suffix of the tree structure, for each role belonging to the subtree of said top suffix.

31. (Currently amended) A computer readable medium having stored thereon instructions ~~for~~ ~~which when executed on a processor implement a method of operating a directory server~~ ~~system, comprising a directory server interacting with entries organized in a tree structure, in~~ ~~which said entries comprise user entries and role entries, ones of said role entries defining a~~ ~~role, and having an associated scope in the tree, the scope being defined from the location of~~ ~~said ones of said role entries in the tree, according to a predefined rule, with the role of an~~ ~~existing role entry being attached to a user entry subject to a first condition, which comprises~~ ~~a role membership condition and the fact that the user entry belongs to the scope of the~~ ~~existing role entry, the method comprising~~:

   a) associating an existing role entry in a tree structure with a first user entry in the tree structure, wherein a directory server interacts with entries in the tree structure, and wherein the existing role entry defines a role and has an associated scope in the tree structure based on the existing role entry's location in the tree structure according to a predefined rule, said associating comprising attaching the role to the first user entry subject to a first condition comprising a role membership condition and the first user entry belonging to the associated scope;

   b) ~~adding extra role data to the existing role entry identifying an extra scope in the~~ ~~tree for the existing role entry~~ adding an attribute to the existing role entry having a special attribute name and being associated with an attribute value defining an extra scope in the tree structure for the existing role entry, wherein the attribute value identifies a designated location in the tree structure outside the existing role entry's associated scope, and further wherein the extra scope is based on the designated location according to a second predefined rule; and

   [[b)]]c)   attaching the role of the existing role entry to a second user entry subject to a second condition comprising said role membership condition and the second user entry belonging to the extra scope.

32. (Currently Amended) The computer readable medium of claim 31, wherein the existing role entry ~~is an indirect role entry designating one or more other roles~~is a nested role entry defining at least one other role.

33. (Currently Amended) The computer readable medium of claim 32, wherein the existing [[indirect]] role entry has an attribute ~~designating the said one or more other roles~~ defining the at least one other role.

34. (Currently Amended) The computer readable medium of claim 31, wherein the role membership condition comprises [[the]] a candidate user entry having an attribute designating the role [[in]] defined by the existing role entry.

35. (Currently Amended) The computer readable medium of claim 31, wherein the existing role entry has a role filter condition, and the role membership condition comprises one or more attributes of [[the]] a candidate user entry meeting the role filter condition.

36. (Original) The computer readable medium of claim 35, wherein the existing role entry has an attribute designating the role filter condition.

37. (Cancelled)

38. (Cancelled)

39. (Currently Amended) The computer readable medium of claim [[38]] 31, wherein the extra scope is defined as a subtree of the designated location.

40. (Currently Amended) The computer readable medium of claim 31, wherein the predefined rule comprises defining the existing role entry's associated scope [[of the existing role entry]] as a subtree of a parent of the existing role entry in the tree structure.

41. (Currently Amended) The computer readable medium of claim 31, [[wherein said method further comprises]] further comprising instructions for:

[[c)]]d) responding to a request of whether a designated user entry has a given role by:

[[c1)]]d1) [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

[[c2)]]d2) determining whether the designated user entry meets the first condition in relation to the corresponding role entry;[[,]]

[[c3]]d3) if the designated user entry does not meet the first condition in relation to the corresponding role entry, determining whether the corresponding role entry has extra role data identifying an extra scope[[,]]; and[[,]]

[[c4]]d4) if the designated user entry does meet the first condition if the corresponding role entry has extra role data, determining whether the designated user entry meets the second condition in relation to the corresponding role entry.

42. (Currently Amended) The computer readable medium of claim 31, [[wherein said method further comprises]] further comprising instructions for:

[[c)]]d) responding to a request for any user entries having a given role by:

[[c1)]]d1) [[determining]] identifying a corresponding role entry corresponding to the given role[[,]];

[[c2)]]d2) scanning the tree to [[determine]] identify any user entries meeting the first condition in relation to the corresponding role entry;[[,]] and

[[c3)]]d3) [[determining whether]] if the corresponding role entry [[corresponding to the given role]] has extra role data identifying an extra scope, [[and, if so,]] scanning the tree to [[determine]] identify any user entries meeting the second condition in relation to the corresponding role entry.

43. (Currently Amended) The computer readable medium of claim 31, [[wherein said method further comprises]] further comprising instructions for:

    [[c)]]d) responding to a request for roles of a given user entry by:

        [[c1)]]d1) [[determining]] identifying a candidate role entry[[,]];

        [[c2)]]d2) determining whether the given user entry meets the first condition [[for the determined]] in relation to the candidate role entry[[,]];

        [[c3)]]d3) if the given user entry does not meet the first condition in relation to the candidate role entry[[, determining whether]] and the [[determined]] candidate role entry has extra role data identifying an extra scope, [[and, if so,]] determining whether the given user entry meets the second condition [[for the determined]] in relation to the candidate role entry[[,]]; and

        [[c4)]]d4) repeating said [[c1)]] d1) through said [[c3)]] d3) with other candidate role entries until an end condition is met.

44. (Currently Amended) The computer readable medium of claim 43, wherein the end condition comprises having [[scanned]] performed said d1) through said d3) with substantially all the applicable [[roles]] candidate role entries.

45. (Currently Amended) The computer readable medium of claim 43, [[in which]] wherein the given user entry belongs to a subtree of a top suffix of the tree structure, [[wherein:]] said [[c2)]] d2) is performed for each role entry belonging to the subtree of said top suffix, and said [[c3)]] d3) is performed for each role entry belonging to any subtree of any top suffix of the tree structure, for each role belonging to the subtree of said top suffix.